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# WESTWARD HO: CONTINUED DISPERSAL OF THE PYGMY MOUSE, BAIOMYS TAYLORI, ON THE LLANO ESTACADO AND IN ADJACENT AREAS OF TEXAS

Larry L. Choate, J. Knox Jones, Jr., Richard W. Manning, and Clyde Jones

Since first described from San Diego, Duval Co., Texas, in 1887 by Oldfield Thomas, noted British mammalogist, the northern pygmy mouse, *Baiomys taylori*, has immigrated northward and westward in the state. Stages in this sometimes spectacular dispersal have been documented by several workers, most recently by Pitts and Smolen (1989). Jones and Manning (1989) reported the first undoubted records of this species from the Texas Llano Estacado—from Dawson and Gail counties. Also rather recently, Stangl and Dalquest (1986) reported the first record of *B. taylori* from Oklahoma. Although there is some question as to the provenience of the one specimen from Oklahoma, it seems likely to us that this mouse now occurs in the southwestern part of that state.

Our field collecting efforts over the past few years on, and adjacent to, the Llano Estacado of northwestern Texas have resulted in specimens of *B. t. taylori* from a number of localities beyond the previously known range of the species. Among these are represented the northernmost record for this mouse in North

America and the westernmost record from Texas, and they include at least 12 localities on the Llano Estacado proper.

## Localities of Record

In the following accounts, habitats at 21 sites from which *Baiomys taylori* has been collected on or near the Llano Estacado are described; these are arranged alphabetically by county and are plotted on Figure 1. Numerals following each site (in one case the same for two nearby sites) indicate location of that place on the map. Some symbols are slightly offset to avoid undue crowding. Measurements of fetuses are in millimeters. Catalogue numbers refer to the collection of Recent mammals at The Museum, Texas Tech University.

*3.5 mi. N and 8.5 mi. W Gail, Borden County* (1).—One male and six females (TTU 53332-38) were trapped atop the Llano Estacado along a fenceline on 23 October 1988. These were reported by Jones and Manning (1989). Johnson grass, sideoats gramma, blue gramma, and mesquite grew in the fencerow on clay-loam soil. *Chaetodipus hispidus* and *Sigmodon hispidus* were taken at the same place. One female *Baiomys* carried three fetuses (crown-rump length, 4).

*9 mi. E Lutie, Collingsworth County* (2).—On 14 May 1986, a male (TTU 43780) and a pregnant female (TTU 43779) collected at this site were trapped on reddish sandy soil in a grassy-weedy fencerow that bordered mesquite rangeland. The female had three fetuses measuring 5 in crown-rump length. Other mammals taken at this location included *Geomys bursarius, Perognathus flavus, Dipodomys ordii, Peromyscus leucopus, Peromyscus maniculatus, Onychomys leucogaster*, and *Sigmodon hispidus*. This locality represents the northernmost on the continent from which *Baiomys* has been taken (Hollander *et al.*, 1987).

*8 mi. N Crosbyton, Crosby County* (3).—One pregnant female (TTU 57224) carrying four embryos that measured 5 in crown-rump length was trapped on 1 September 1989, along with *Neotoma albigula* and *Peromyscus leucopus*, in a grassy fenceline just below the caprock of the Llano in Blanco Canyon. The soil at this site, which is adjacent to Farm-to-Market Road 651, is shallow sandy-loam.

*5 mi. ENE Key, Dawson County* (4).—In an area where the scarp of the Llano is relatively gentle and not as high as farther north, a nonpregnant female (TTU 53339) was taken in a sparsely to moderately vegetated fenceline at the rim of the caprock on 22

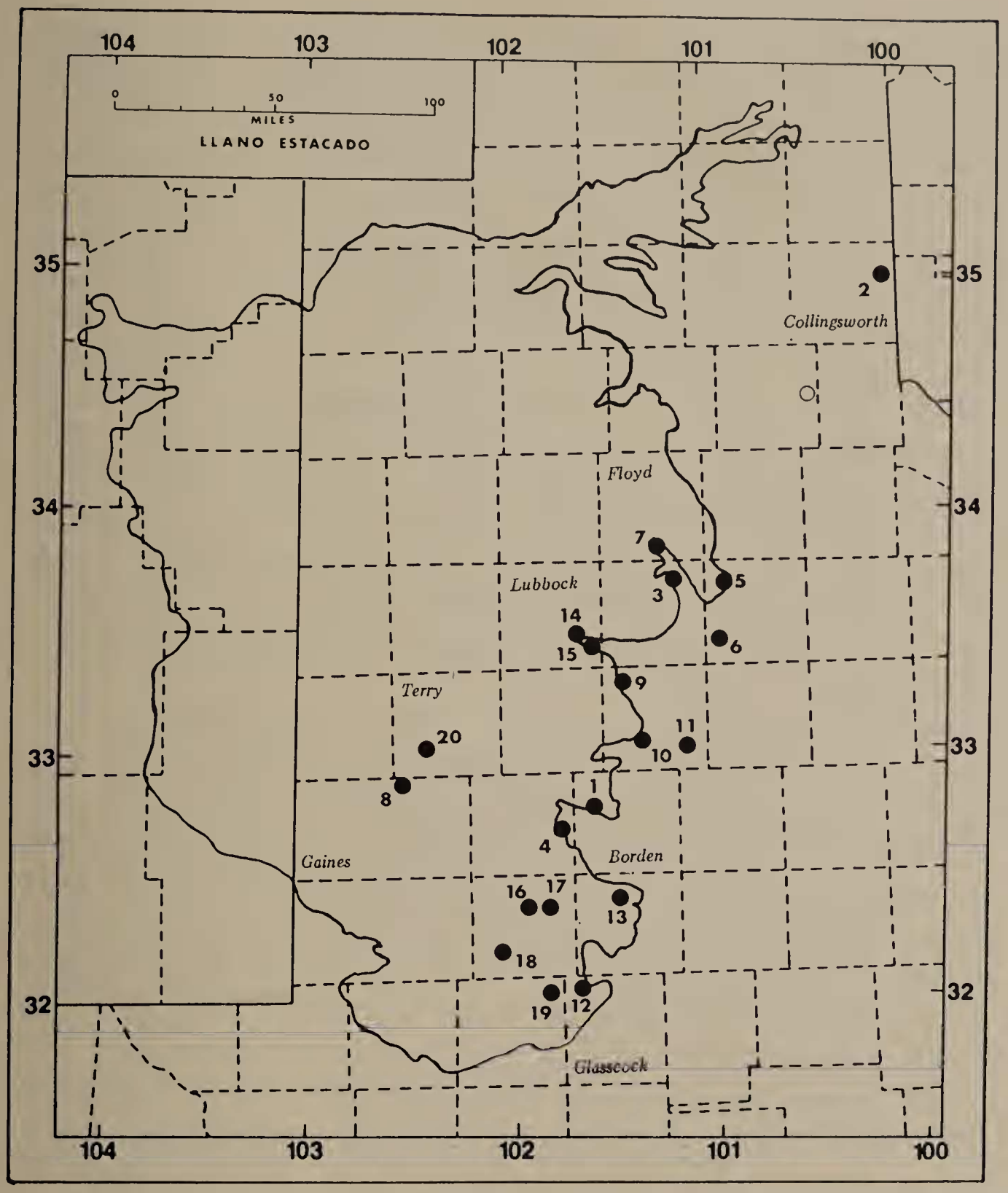


FIG. 1.—Records (solid symbols) of *Baiomys taylori* from the Llano Estacado and immediately adjacent areas. The extent of the Llano in western Texas and eastern New Mexico is superimposed on the map. Numbers associated with symbols are those given for localities in text. The several county names on the map are given for reference. The one open symbol represents specimens reported by Cleveland (1986) from 3 km. SW Estelline, Hall County.

October 1988 (Jones and Manning, 1989). In addition to weeds and grasses, other plants there included scattered juniper, oak, acacia, and yucca, which grew on clay-loam soil.

*1 mi. N and 4 mi. E McAdoo, Dickens County* (5).—Two males and a nonpregnant female (TTU 57289-91) were live-trapped on 8 October 1989 in dense stands of grasses and forbs along the

right-of-way of a farm-to-market road. Other mammals trapped on this clay-loam soil were *C. hispidus, P. leucopus, P. maniculatus*, and *S. hispidus*. Most of the property in the general area of this location consisted of cotton fields or overgrazed mesquite rangeland. Dense growths of grasses were found only along fencerows or roadways. The break between the Llano and the plains country to the east, just a few hundred yards from the trapsite, is not so sharp as it is to the north and south.

*3 mi. N and 8 mi. W Spur, Dickens County* (6).—On 7 and 8 March 1987, boards and pieces of corrugated scrap metal were overturned at an old farmstead in search of vertebrates. One nonpregnant female (TTU 45558), three males (TTU 45559-61), and three small juveniles (TTU 51934-36) were found under the debris. Reptiles taken from the same location were *Crotalus atrox, Masticophus flagellum, Tantilla* sp., *Sceloporus olivaceus*, and *Eumeces obsoleta*. The soil at this place is a fine sandy-loam.

*6 mi. S Floydada, Floyd County* (7).—On 29 April 1989, three *B. taylori*, two males and a nonpregnant female (TTU 56212-14), and one western harvest mouse were trapped in thick short grasses and mid-grasses on loamy soil in Blanco Canyon. The mice were taken on a gentle slope, which was nearer the vertical caprock escarpment than the stream bed at the canyon bottom. Mesquite, yucca, and clumps of prickly pear dotted the upper slopes of the canyon, whereas isolated hackberry and stands of various bluestem grasses were found nearer the stream bed.

*1 mi. N and 1 mi. E Seagraves, Gaines County* (8).—On 18 November 1989, three pygmy mice, two females (one postlactating) and a male (TTU 57441-43), were trapped in thick grasses adjacent to a railroad right-of-way on fine sandy-loam soil. Dense vegetation at this site consisted of sand dropseed, little bluestem, Johnson grass, *Aristida, Amaranthus*, Russian thistle, *Yucca*, mesquite, and some *Opuntia*. *Chaetodipus hispidus, Sigmodon hispidus*, and *Mus musculus* were taken in the same trapline. This site is the westernmost in Texas from which *Baiomys taylori* has been obtained, and also is the westernmost record of the subspecies *B. t. taylori*.

*4 mi. E Southland, Garza County* (9).—Stangl *et al.* (1983) reported one female (TTU 38713) trapped on 23 January 1982 along the upper rim of the Llano Estacado escarpment in rough rocky terrain and mesquite grassland. Other mammals taken at

this site were *Reithrodontomys montanus, P. leucopus, P. maniculatus, O. leucogaster, N. micropus,* and *S. hispidus*.

*10 mi. S Post, Garza County* (10).—At the base of the Llano Estacado, on 2 February 1980, members of a mammalogy class from Texas Tech University, dismantling woodrat houses in search of desert shrews, captured a male and female (TTU 35125-26) *Baiomys* by hand. Other mammals found during this exercise were *Notiosorex crawfordi, Peromyscus* sp., *N. micropus*, and *S. hispidus*. The site supported large clumps of *Opuntia*. No reproductive data were recorded for these mice.

*4 mi. E Justiceburg, Garza County* (11).—On 22 April 1987, students in a class from Texas Tech University, searching for reptiles, obtained one male pygmy mouse (TTU 45562) at this locality. The mouse was found under a log along an ungrazed roadside. A baseball-sized nest, presumably of the *Baiomys* and consisting of fine grasses, also was found under the log.

*0.5 mi. S and 11 mi. W Lees, Glasscock County* (12).—One male and one postlactating female (TTU 56700-01) were live-trapped on 6 June 1989 in a grassy fencerow adjacent to mesquite grassland. The vegetation at this site was not so dense as that at most other localities reported here. Other mammals trapped at this site were *P. flavus, C. hispidus, D. ordii*, and *S. hispidus*.

*1 mi. N Luther, Howard County* (13).—On 9 June 1989, four *Baiomys*, three males and a nonpregnant female (TTU 56858-61), were collected in an old, unkempt cemetery. Thick short grasses predominated, with elm and mesquite trees at the perimeter of the cemetery. Some prickly pear and barrel cacti also were present. *Reithrodontomys megalotis* and *S. hispidus* were taken at this place in association with pygmy mice.

*1 mi. S Luther, Howard County* (13).—One lactating female *Baiomys* (TTU 56862) and two *R. megalotis* were trapped on the same date given above from a roadside fenceline adjacent to an overgrazed mesquite pasture. Grasses, mostly grammas, near the fenceline and along the right-of-way were exceptionally thick and extremely dusty due to dry weather and wind-blown caliche from the adjacent road. The soil at this site was tight sand with high clay content.

*4 mi. S and 7 mi. E Lubbock, Lubbock County* (14).—T. R. Mollhagen and J. A. Homan trapped a male pygmy mouse (TTU 31939) on 7 March 1977, in lowland habitat above Buffalo Springs Lake. *Reithrodontomys montanus, R. megalotis*, and *Peromyscus* sp. also were taken there.

*4.5 mi. N and 1 mi. E Slaton, Lubbock County* (15).—On 27 February 1977 Mollhagen and Homan trapped a male *Baiomys* (TTU 31933) in dense grasses and sedges along a slough below the caprock. This is in conflict with Stangl *et al.* (1983), who reported the location as 4 mi. E Slaton in rough rocky terrain. *Peromyscus leucopus, P. maniculatus, S. hispidus*, and *M. musculus* were taken in the same trapline. Five additional *B. taylori* (a female and four males, TTU 31934-38) were captured at this same location on 7 March 1977.

*7 mi. N and 1 mi. E Tarzan, Martin County* (16).—On 7 June 1989, three males and a nonpregnant female (TTU 56702-05) were live-trapped in two separate transects at this locality. Each transect yielded two *B. taylori* from fencerows adjacent to mesquite grassland. One of the fencelines contained dense stands of Johnson grass and produced the following associated rodents: *D. ordii, R. megalotis, N. micropus, S. hispidus*, and *M. musculus*. In the other line, lacking Johnson grass, *P. flavus, N. micropus*, and *S. hispidus* were taken in addition to the *Baiomys*.

*7 mi. N and 5 mi. E Tarzan, Martin County* (17).—Five *Baiomys*, three males and two females (TTU 56706-11), were collected in weedy-grassy fencerows adjacent to a dirt road on the same day as above. Some traps were set along fencelines adjacent to mesquite grassland, whereas others were set next to a cultivated field. Traps were separated from the road by a deep ditch. Some Johnson grass and small mesquite bushes were found at places along the fencerows. One of the females examined evinced no reproductive activity, but the other carried two fetuses that measured 10 in crown-rump length.

*7 mi. N and 17 mi. W Stanton, Martin County* (18).—A male (TTU 57292) was live-trapped along a fencerow bordering a county road on 21 October 1989. Grasses and thick mesquite, along with some yucca, were dominant at this sandy site. Cotton rats and *Peromyscus leucopus* were taken in the same trapline.

*6.5 mi. S and 1 mi. E Stanton, Midland County* (19).—On 6 June 1989, three female pygmy mice (TTU 56711-13) were trapped in a grassy fenceline adjacent to mesquite rangeland. Two of the females each carried two fetuses (5 and 14 in crown-rump length). Other mammals trapped on this sandy soil included *G. bursarius, C. hispidus, D. ordii*, and *S. hispidus*.

*5 mi. S and 5 mi. W Brownfield, Terry County* (20).—A male and a lactating female (TTU 57363-64) were taken along a railroad right-of-way on 2 November 1989, and provide one of the

westernmost records of occurrence in Texas for the northern pygmy mouse. *Reithrodontomys megalotis* and *R. montanus* were trapped in the dense grasses of the same trapline. The soil was sandy and one *D. ordii* was taken at one end of the line where vegetation was somewhat sparse. Dominant plants included sand dropseed and sand burr, with careless weed, Russian thistle, and mesquite along the periphery. Some Johnson grass was present as were small amounts of yucca and prickly pear. Another male (TTU 57444) was obtained at this site on 18 November 1989.

## Discussion

Colonization of the High Plains of western Texas by *Baiomys taylori* has taken place in recent years, probably mostly within the past decade. Principal immigration seems to have been from the southeast, where the Llano Estacado merges without sharp con- trast with the Edwards Plateau region, and at places such as in Borden, Dawson, and even Dickens counties where the break at the edge of the caprock, though present, is relatively gentle. Other localities, where man-made roadways and railroads cut through the caprock onto the Rolling Plains to the east also should be investigated as potential corridors for westward dispersal of pygmy mice. It is, of course, possible that *Baiomys* was transported to one or more sites on the Llano Estacado in shipments of agricultural products (hay, for example), but we doubt this explains the now widespread occurrence of this species in the southeastern and south-central parts of the region (Fig. 1).

Once on the High Plains, *B. taylori* evidently has dispersed in grassy habitats along roadsides, railroads, and the few other areas not planted to cotton. The Conservation Reserve Program, through which many hundreds of acres of land have been replanted to grasses in the past few years, likely will allow, possibly even promote, widespread additional movements of pygmy mice. In other words, we look for further westward and northward dispersal of these mice in the near future. In this regard, it is noteworthy that we took no pygmy mice in 1989 in more than 5800 trap nights in open mesquite grassland in eastern and central Andrews County or in 280 trap nights along weedy fencerows in eastern and central Yoakum County, areas just west of counties in which the species now is known to occur (Martin and Terry counties, respectively).

Just where climatic or other limiting factors may halt, more or less, the expanding range of this species is unknown. However, we suspect that any particularly harsh winter on the Llano could impact unfavorably on existing populations and thus inhibit continued movement, at least for a few years.

Reproduction, of course, is a key factor in the dispersal process. The annual reproductive cycle of *Baiomys* on the Llano Estacado and in adjacent areas seems to extend from late winter to autumn (we have juveniles taken in early March and a lactating female from early November), perhaps not year round as in the southern part of Texas (Schmidly, 1983). Pregnant females are represented in our material from May, June, September, and October. Number of fetuses ranged from two to four (average 2.5) in six pregnancies for which we have record.

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Address of authors: *The Museum and Department of Biological Sciences, Texas Tech University, Lubbock 79409.* *Received 27 November 1989; accepted 6 December 1989.*